Institute for European Environmental Policy

Nature and its role in the transition to a Green Economy

Patrick ten Brink,

Senior Fellow and Head of Brussels Office, IEEP

Beijing, 21 January 2015

TEEB Multi-stakeholder Workshop

Oriental Garden Hotel, Beijing, China

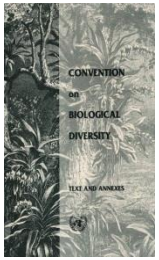
Presentation Structure

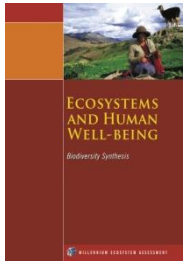
1. **TEEB Overview**
2. **What is a green economy?**
3. **What is nature's role in the transition to a green economy?**
4. **What are the building blocks of a transition to a green economy?**
5. **Conclusions**

Institute for European Environmental Policy

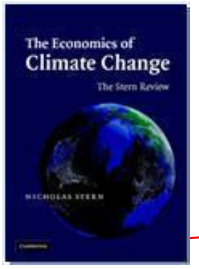
ten Brink P., Mazza L., Badura T., Kettunen M. & Withana S. (2012) *Nature and its Role in the Transition to a Green Economy.* http://www.ieep.eu/publications/2012/10/nature-and-its-role-in-the-transition-to-a-green-economy--1157

TEEB's Genesis, Aims and progress



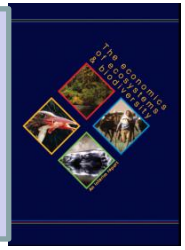


Ecol./Env. Economics literature



COPI
- Scoping the Science
- TEEB scoping
- Accounting
- Forest values

Interim Report



CBD COP 9
Bonn 2008

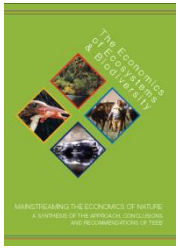
Climate Issues Update

Input to
UNFCCC 2009

TEEB Reports
Brussels 2009,
London 2010

India, Brazil, Belgium,
Japan & South Africa
Sept. 2010

TEEB Synthesis



BD COP 10
Nagoya,
Oct 2010

TEEB Books

Phase 1 | **Phase 2**

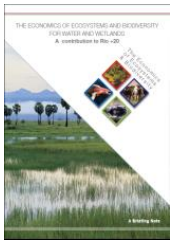
TEEBs progress: guidance and implementation

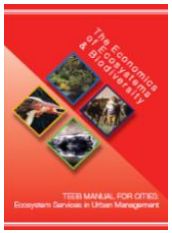
TEEB Cases

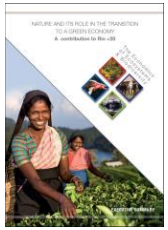
TEEB for Business

TEEB Thematic Reports

TEEB W&W; Nature & GE
TEEB Oceans; TEEB for Cities

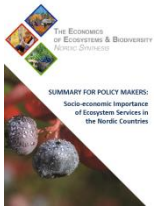


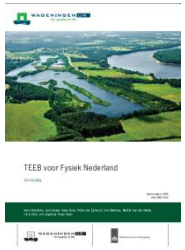




NC Accounting & Water Quality

TEEB country studies

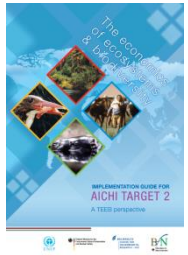


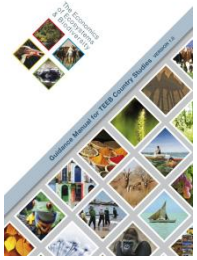


The Netherlands, Germany, Belgium, Nordics, Arctic, Norway, India, Brazil, Finland….

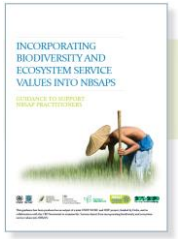
Guidance

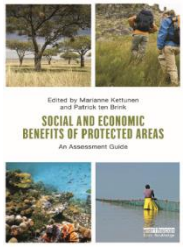
TEEB Implementation Manual
Aichi Target Guides





NBSAPs & BD values





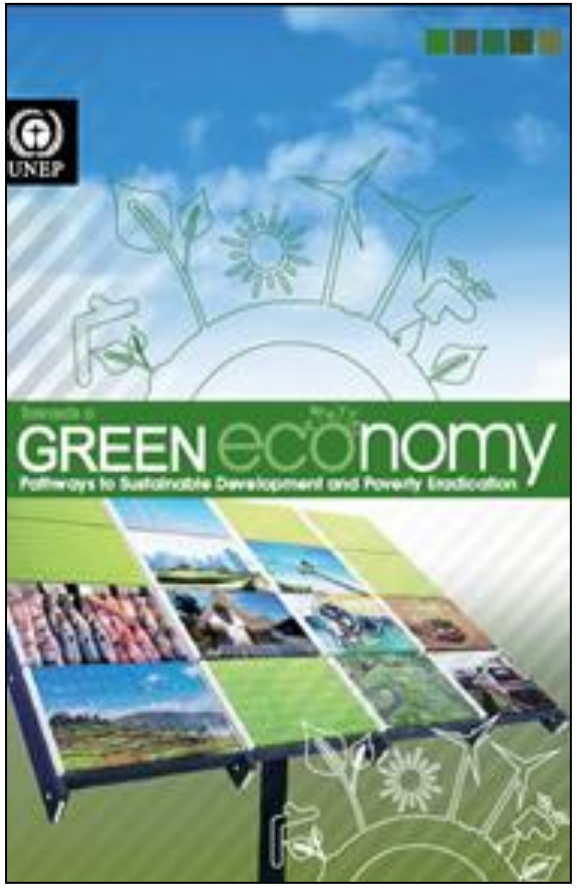
Value of PAs

Regional Development

Phase 2

Phase 3: TEEB Implementation

What is a GREEN economy ?



UNEP defines a green economy as "***one that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities.***

In its simplest expression, a green economy can be thought of as one which is ***low carbon***, ***resource efficient*** *and* ***socially inclusive***" (UNEP 2011).

Institute for European Environmental Policy

(UNEP 2011) 'Towards a Green Economy – Pathways to Sustainable Development and Poverty Eradication, A Synthesis for Policy Makers', Www.unep.org/greeneconomy/Portals/88/documents/ger/GER_synthesis_en.pdf

Multiple building blocks to a Green Economy

Key Message:

There are a range of building blocks for the transition to a green economy

The relative emphasis of these different blocks depends on the national context.

Institute for European Environmental Policy

ten Brink P., Mazza L., Badura T., Kettunen M. & Withana S. (2012) *Nature and its Role in the Transition to a Green Economy.* http://www.ieep.eu/publications/2012/10/nature-and-its-role-in-the-transition-to-a-green-economy--1157

Building blocks for the transition to a green economy

Current Situation

Declining Sustainability in a Brown Economy

Resource over-exploitation & pollution pressures

Climate Change

Biodiversity and natural capital loss

Critical ecological and resource thresholds passed or at risk

Resource scarcity and limited access to a clean environment

Health impacts and man-made natural disasters

An economy that is not resource efficient, low carbon and socially inclusive

Building Blocks in the Transition to a Green Economy

G. Good governance

Business-as-Usual Approaches

A. Avoiding Unsustainable Trade-offs

+

B. Environmental compliance & infrastructure

+

Active environmental management

C. Active Risk Management

+

D. Proactive Investment in Natural Capital

+

Pursuing environmental sustainability

E. Eco-efficiency

+

F. Decoupling via Radical Innovation & Demand change

Good Governance

Ambitions for the Future

A Green Economy

Improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities

Staying within a 'safe operating space': using resources within the planet's regenerative capacities & avoiding critical ecological thresholds

No net loss of biodiversity and climate change within 'acceptable' limits

Sustainability for future generations and business: available natural capital and a clean environment

Health and livelihoods for citizens and communities

An economy decoupled from environmental impacts and resource use

Source: Patrick ten Brink & Leonardo Mazza, own representation

Nature at the core of the Green Economy

Key Message:

Working with nature should be at the heart of the transition to a green economy

Nature is essential to the health and growth of economies, societies and individuals through the provision of a **multitude of ecosystem services**.

In spite of this, **the values of nature to economies and society have often been overlooked** and not reflected in the decisions of policy makers, businesses, communities or citizens, **contributing to the loss of biodiversity** and subsequent impacts on people and the economy.

Institute for European Environmental Policy

ten Brink P., Mazza L., Badura T., Kettunen M. & Withana S. (2012) *Nature and its Role in the Transition to a Green Economy.* http://www.ieep.eu/publications/2012/10/nature-and-its-role-in-the-transition-to-a-green-economy--1157

Ecosystems provide multiple ecosystem services

Provisioning services

- Food
- Fibre
- Fuel
- Water provision
- Ornamental resources
- Genetic resources
- Medicinal resources

Regulating Services

- Climate regulation
- Water and waste purification
- Air purification
- Natural hazards management
- Erosion control
- Pollination
- Biological control

Cultural Services

- Aesthetics
- Landscape value,
- Recreation & Tourism
- Cultural values
- Inspirational services
- Education
- Scientific Knowledge

Supporting Services: **Soil formation & fertility, photosynthesis, nutrient cycle**

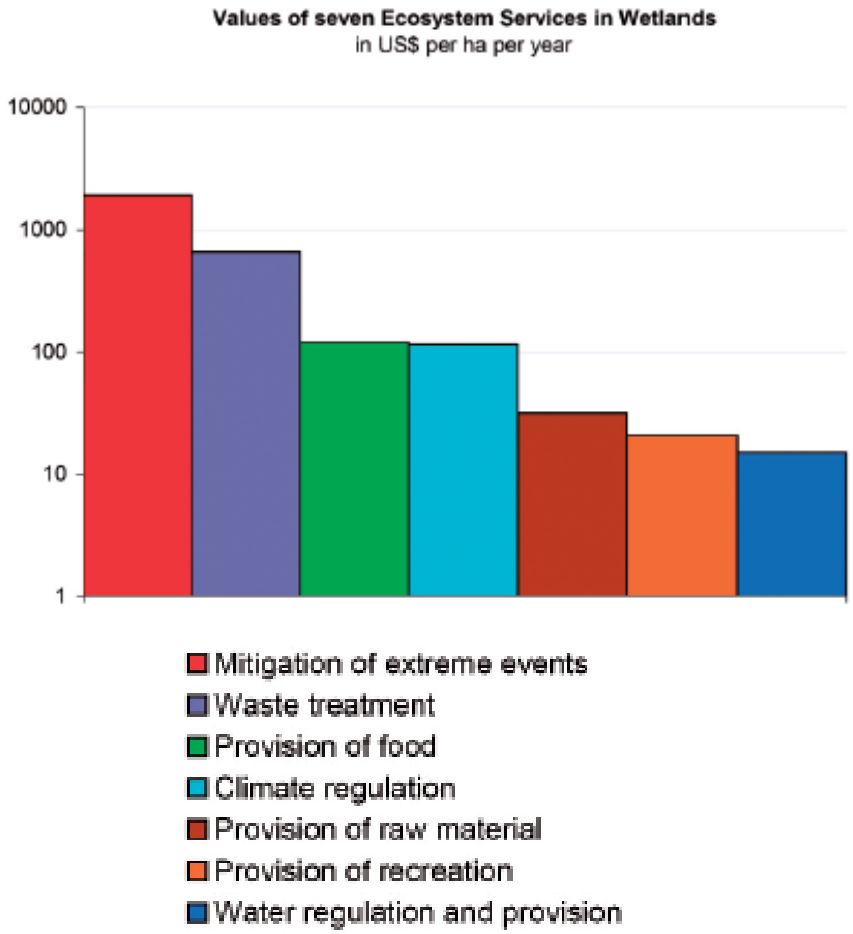
Habitat services such as nursery service, gene pool protection.

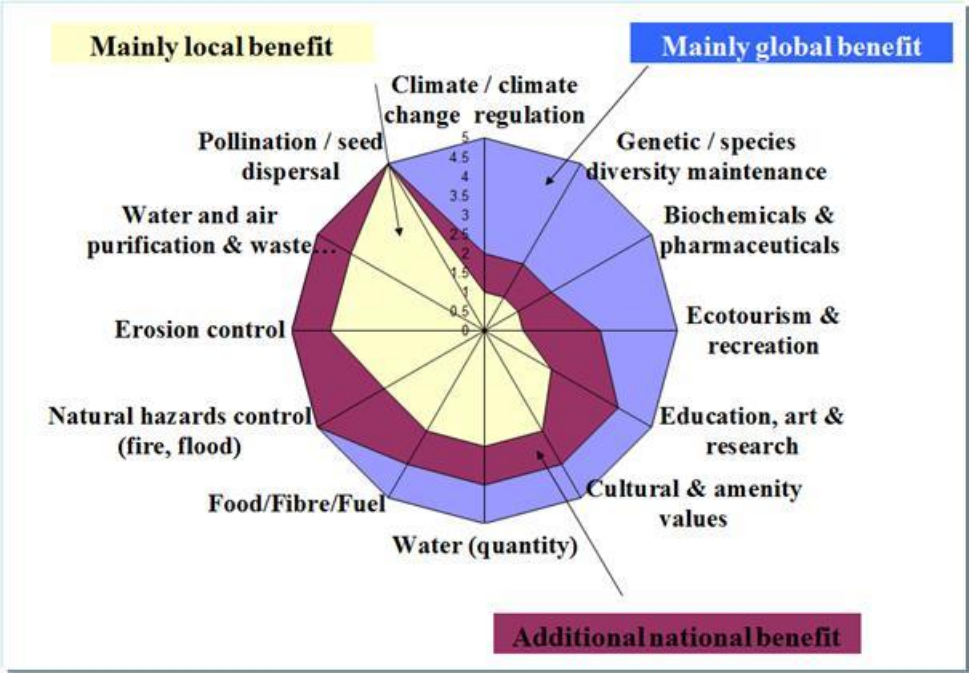
Some are private goods (eg food provisioning), **others public goods that can become (part) private** (eg tourism, pollination), **others are pure public goods** (eg health, identify)

… generating multiple values in different locations

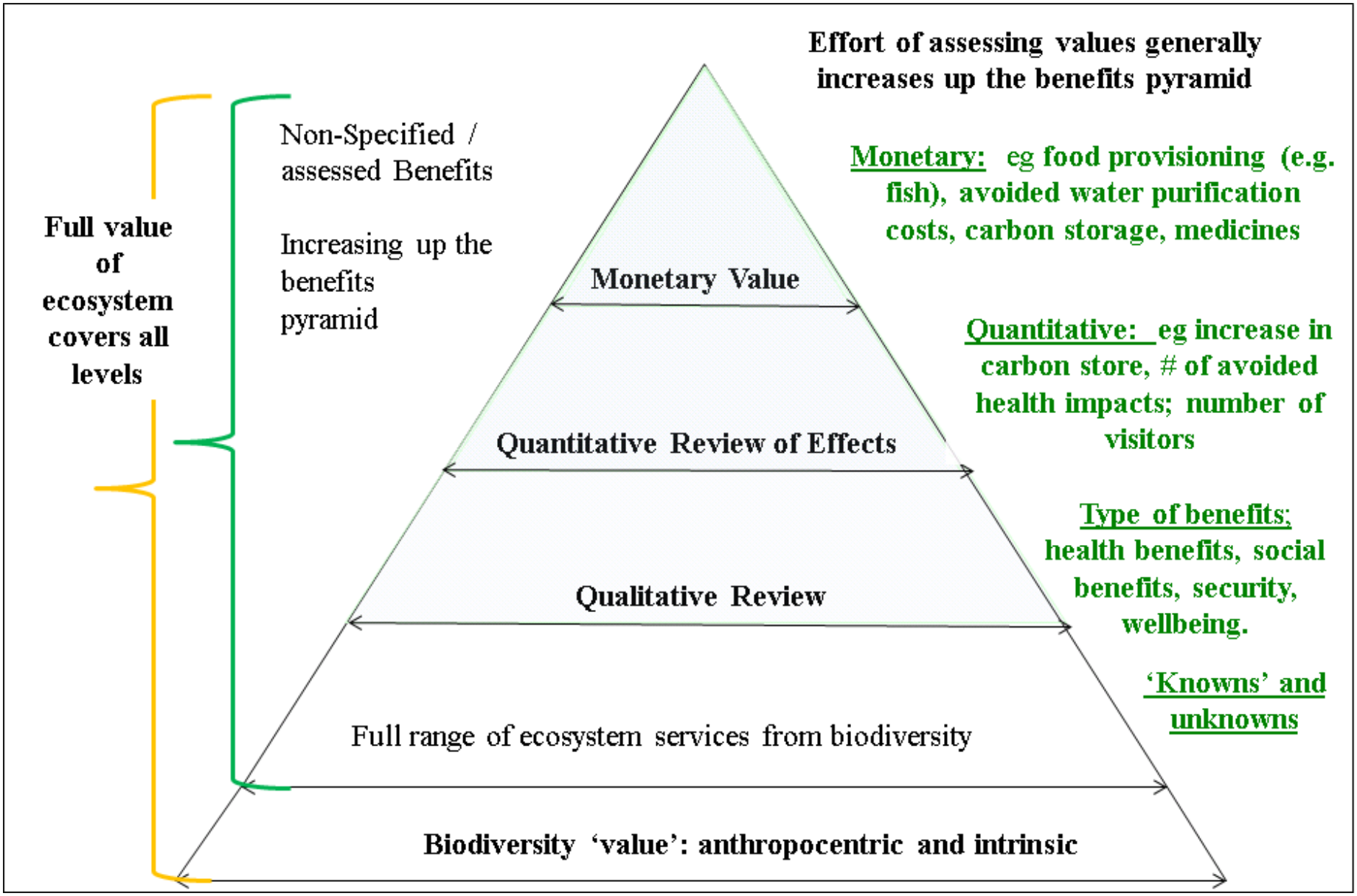
Many ecosystem services from the same piece of land

Benefits local to global





…measured in different ways



Human and societal well-being depends on nature.

Key Message:

The **rural poor in particular are fundamentally dependent on ecosystem services**.

Where natural capital is degraded and lost, there is a **risk that the livelihoods of entire communities** are **undermined** and **humans suffer**.

Institute for European Environmental Policy

ten Brink P., Mazza L., Badura T., Kettunen M. & Withana S. (2012) *Nature and its Role in the Transition to a Green Economy.* http://www.ieep.eu/publications/2012/10/nature-and-its-role-in-the-transition-to-a-green-economy--1157

Marine Protected Areas increase living standards

MPA: Tubbataha Reefs, Philippines - UNESCO World Heritage site: 396 species of corals & higher species diversity than the Great Barrier Reef

Problem Recognition –

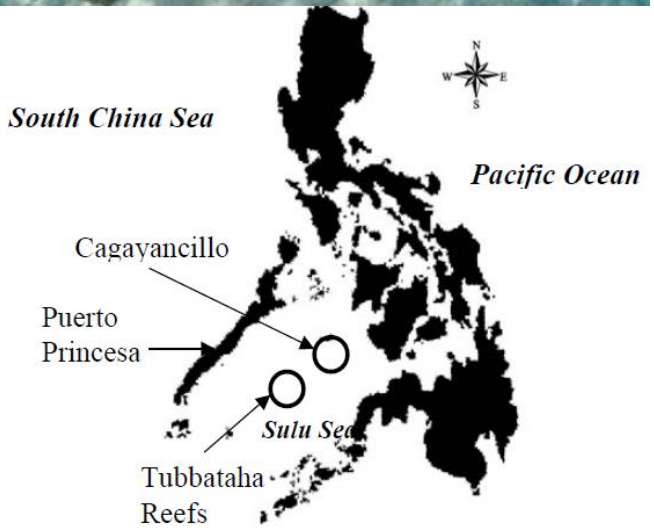
1998 Bleaching & losses

Policy Solution

"No-take" areas agreed

Tubbataha Reefs Natural Park Act in 2010

+ 10 mile buffer zone around marine reserve



Impacts of policy

- **Increase coral cover – 40% 1999-2003, 50% 2004**
- **Fish biomass in nearby reefs doubled since 2000 and fish catches almost doubled 1999 – 2004**
- **Survey: significant increase in living standards 2000 to 2004**

Sources: Tongson 2007, Samonte-Tan et al. 2008, Dygico 2006; in TEEBCases for TEEB for local and regional Policy

Degraded ecosystems can undermine well being & livelihoods

Ex.: Working for Water (WfW): South Africa & the Manalana wetland

- **Severely degraded by erosion that threatened to consume the entire system**
- **Livelihood benefits from degraded wetland was 34 % of healthy ecosystem**
- **WfW public works programme intervened in 2006 to reduce the erosion and improve the wetland's ability to continue providing its beneficial services**

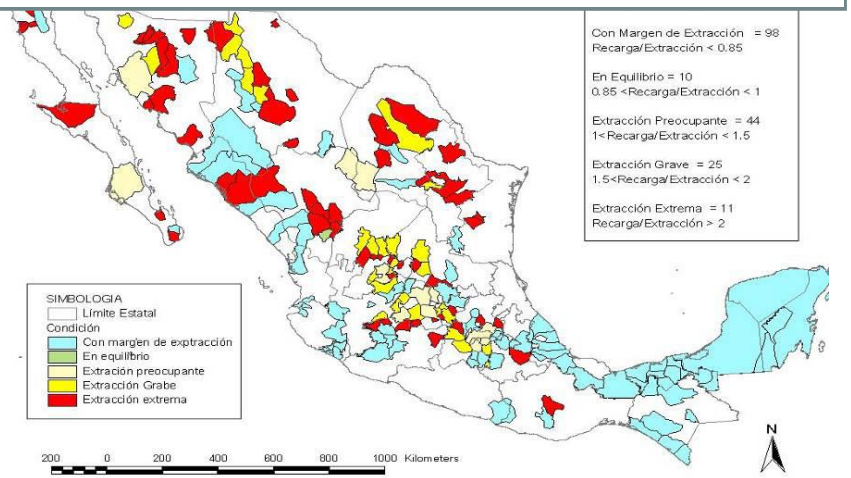
Sources: Pollard et al. 2008; Wunder et al 2008a; http://www.dwaf.gov.za/wfw/

Sources: TEEBCases for TEEB for local and regional policy

One instrument can address many problems

Hydrological services: Aquifer recharge; Improved surface water quality, reduce frequency & damage from flooding`

Solution: **Mexico PSAH: PES to forest owners to preserve forest: manage & not convert forest**

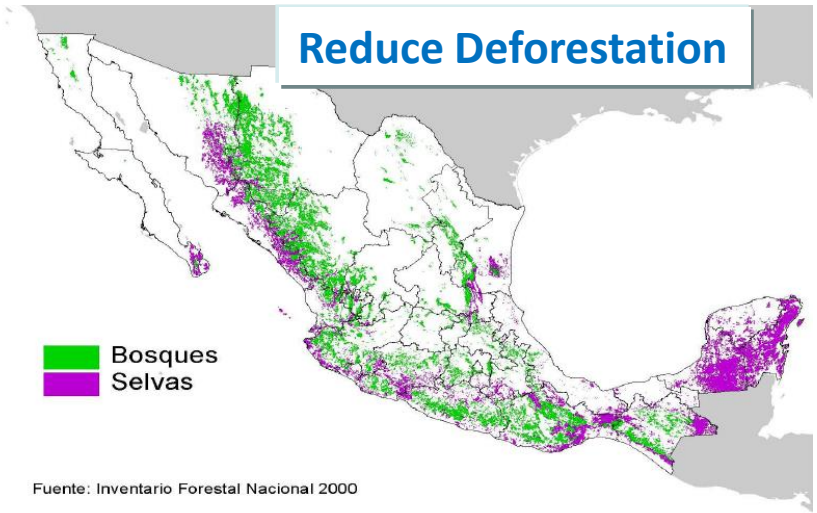


Results:

Deforestation rate fell from 1.6 % to 0.6 %.

18.3 thousand hectares of avoided deforestation

Avoided GHG emissions ~ 3.2 million tCO2e



Munoz 2010; Muñoz-Piña et al. 2008; Muñoz-Piña et al. 2007.

Understanding Nature's Values is important

Key Message:

There must be a clear understanding of the value of nature and how to take this value into account in public and private decisions in light of the multiple benefits it provides.

This is one of many ways of assessing the role and importance of nature.

Institute for European Environmental Policy

ten Brink P., Mazza L., Badura T., Kettunen M. & Withana S. (2012) *Nature and its Role in the Transition to a Green Economy.* http://www.ieep.eu/publications/2012/10/nature-and-its-role-in-the-transition-to-a-green-economy--1157

Protected Areas - “crown jewels” of biodiversity

Of immense Intrinsic value

Also offer:

Food security

Water security (supply & quality)

Climate mitigation & adaptation,

Knowledge & education

Culture & identity

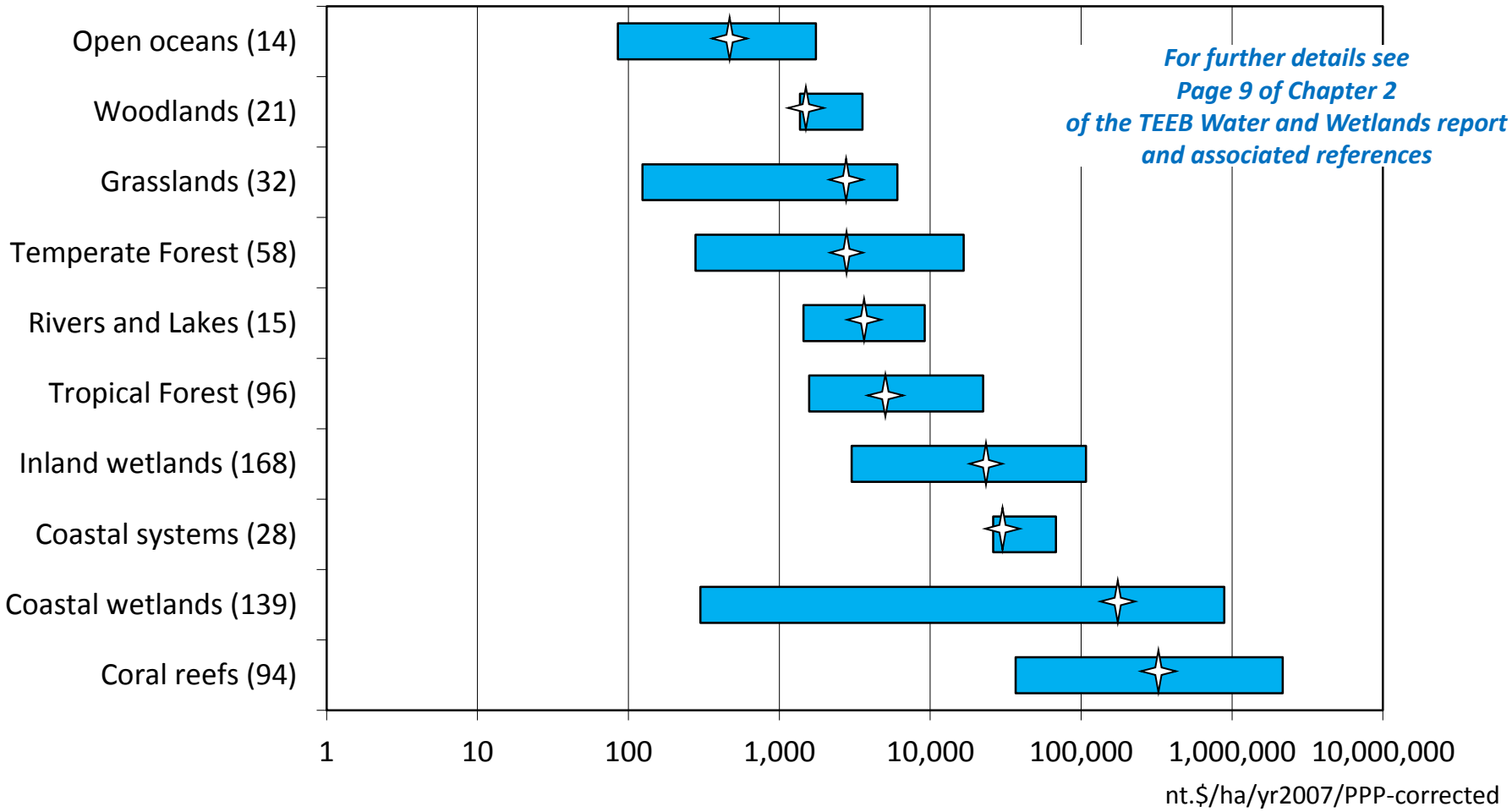
Recreation and tourism

and many other ecosystem services

Dudley and Stolton, 2010

Protected for biodiversity, accepted and funded as multiple benefits appreciated by decision makers and stakeholder?

The evidence base: range of values of ecosystem services



EU's Natura 2000 network: 26,000 sites ~ 18 % of EU

Funding a challenge

Costs ~ 5.8 bnEUR/yr

Source: Gantioler et al 2010

Natura 2000 benefits

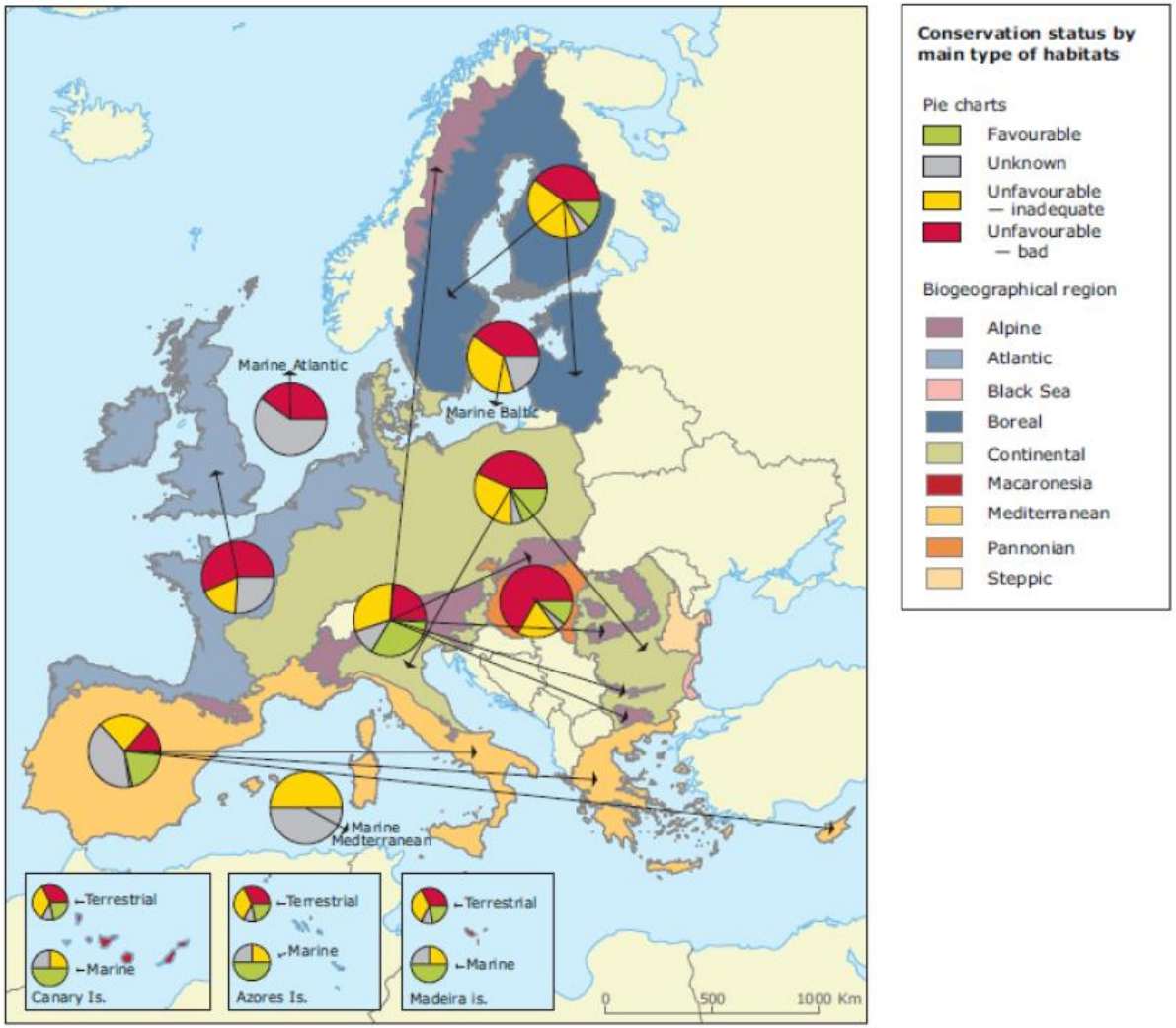
Illustrative value of between €200-300 bn/yr

ten Brink et al. (2012)

Carbon Value:

Natura 2000 network stores ~ 9.6 btC (equiv. 35 bt CO2), Worth ~ €607bn-€1,130bn (stock value in 2010)

Markandya & Ding in ten Brink et al., 2012



European Commission using the argument of Natura 2000's values to get support and funding…

Protected areas as promoters of regional economy (Finland)

Name or national park *Some examples of total 37*	Local, accumulative economic impacts of visits (EUR mil / year)	Person-years of employment
Nuuksio	2.1	16
Pallas-Yllastunturi	34.3	450
Oulanka	15.5	200
Etc.		

According to the assessment €1 investment in national parks and other key protected areas can results in €10 return to local economies.

See Kettunen et al. (2012) TEEB Nordic , Kettunen and ten Brink (2013) and Metsahallitus for references

Investments in nature can save money

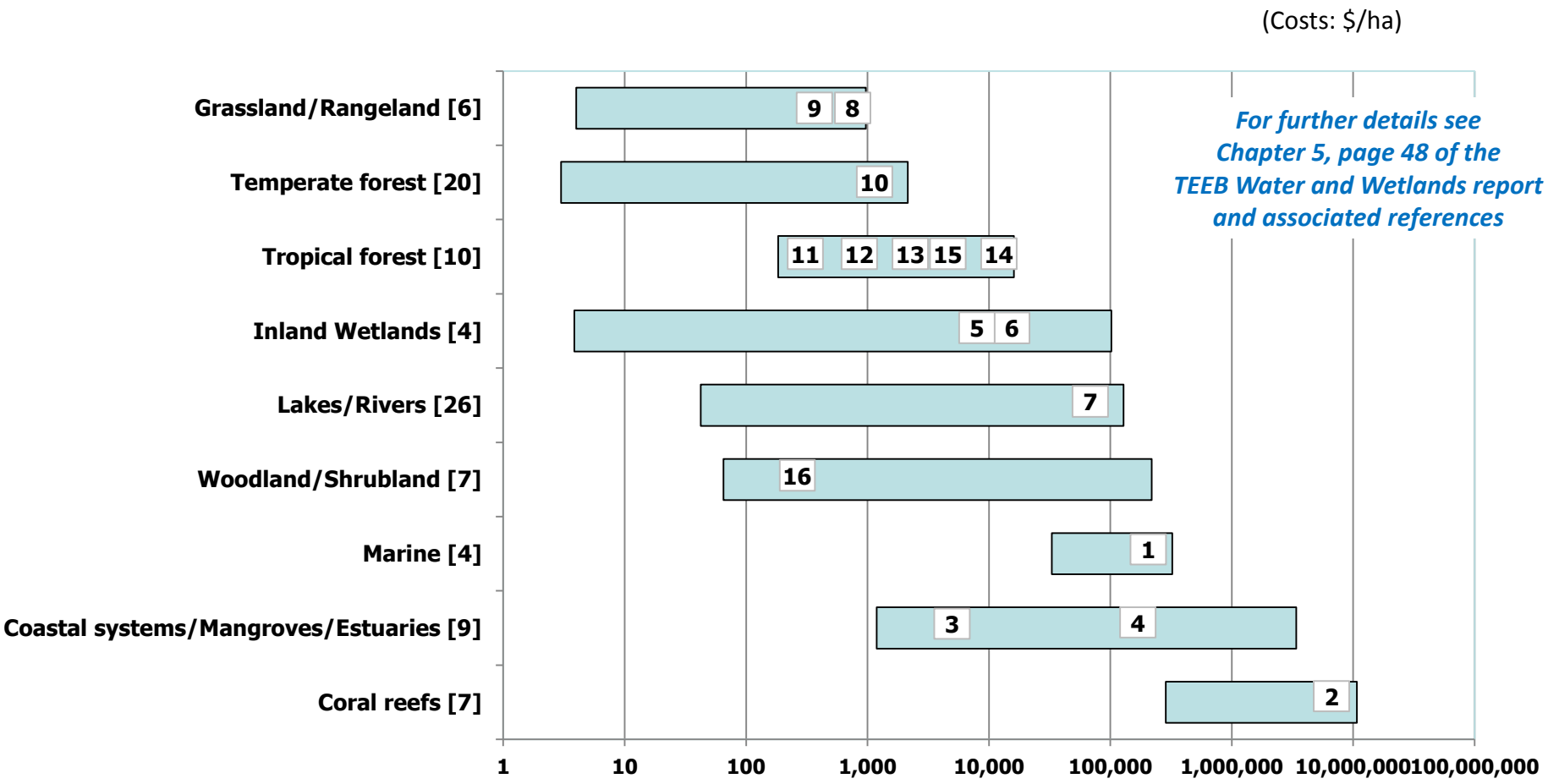
Key Message:

Investments in nature today – whether restoration or protected area management – can save money and promote economic growth in the long term and must therefore be seen as an integral part of the transition to and the foundation of a green economy.

Institute for European Environmental Policy

ten Brink P., Mazza L., Badura T., Kettunen M. & Withana S. (2012) *Nature and its Role in the Transition to a Green Economy.* http://www.ieep.eu/publications/2012/10/nature-and-its-role-in-the-transition-to-a-green-economy--1157

Restoration: can be costly, but can offer good returns



For example: **Germany:** peatland restoration: avoidance cost of CO2 ~ 8 to 12 €/t CO_2 (0-4 alt. land use). Lower than many other carbon capture and storage options

Sources: Förster (2010); MLUV MV (2009); Schäfer (2009)

Stakeholders are responding to Nature's values

Assessing the value of working with natural capital has helped determine where ecosystems can provide goods and services at lower cost than by man-made technological alternatives and where they can lead to significant savings:

`

USA-NY: Catskills-Delaware watershed for NY: PES/working with nature saves money **(~5US$bn)**

New Zealand: Te Papanui Park - water supply to hydropower, Dunedin city, farmers **(~$136m)**

Mexico: PSAH to forest owners, aquifer recharge, water quality, deforestation, poverty **(~US$303m)**

France: Priv. Sector: Vittel (Mineral water) PES et al for water quality

Venezuela: PA helps avoid potential replacement costs of hydro dams **(~US$90-$134m over 30yr)**

Finland: restoring green infrastructure for cost-effective flood mitigation **(~ 15% cheaper)**

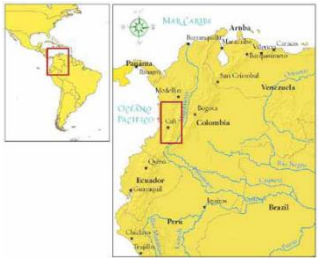
Critical to assess where working with nature saves money for public (city, region, national), private sector, communities and citizens & who can make it happen

Sources: various. Mainly in TEEB for National and International Policy Makers, TEEB for local and regional policy and TEEB cases

Upstream downstream problems can be solved

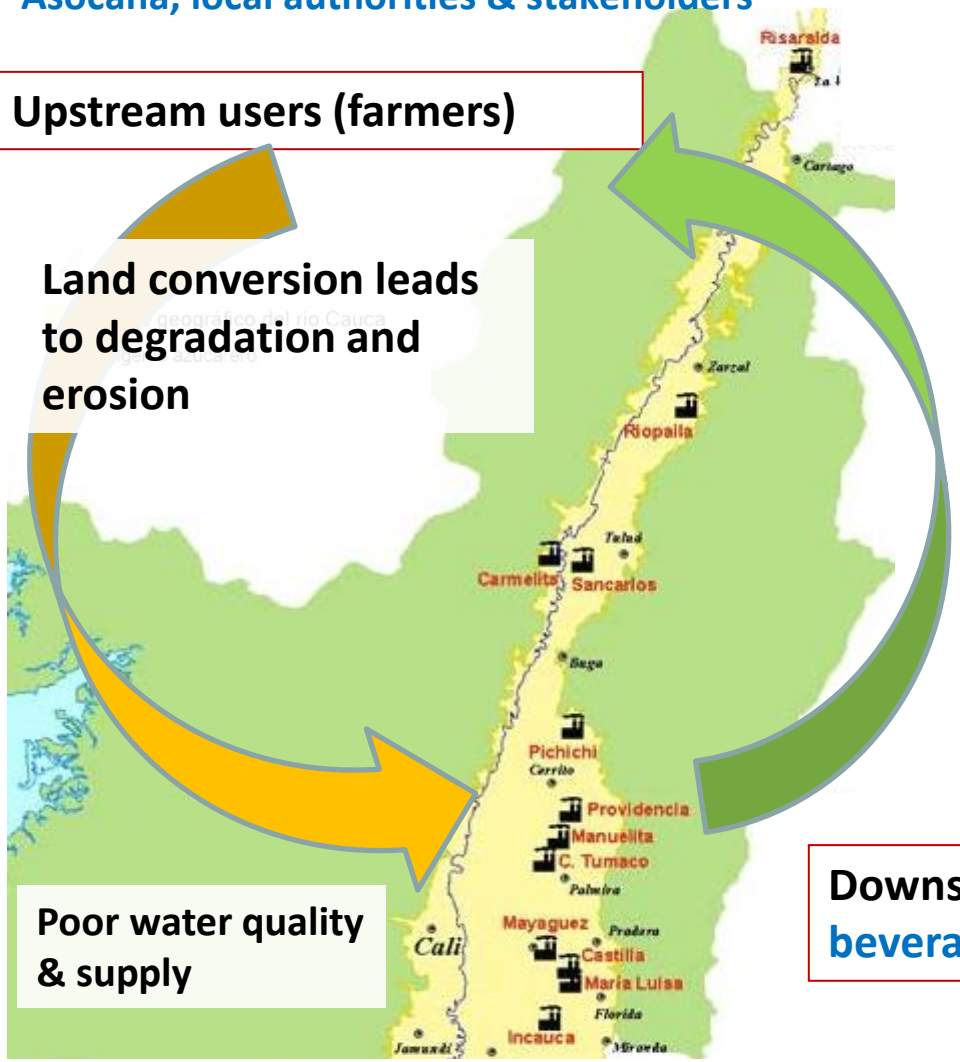
Water Fund in East Cauca Valley, Columbia

(Fondo de Agua por la Vida y la Sostenibilidad (FAVS): TNC, Asocaña, local authorities & stakeholders



Upstream users (farmers)

Land conversion leads to degradation and erosion



Poor water quality & supply

US$ 16m over 5 years for the conservation and restoration of 600 square miles of moist tropical forests and montane grasslands

920.000 people in the cities of **Palmira, El Cerrito, Pradera, Florida and Miranda benefit.**

Securing ecosystems, biodiversity and water-related services: reducing erosion and maintaining regular water flows

Downstream users (sugarcane producers, beverage industry, drinking water)

Sources: TEEB case by Goldman et al. 2010 and http://www.naturalcapitalproject.org/pubs/East_Cauca_Valley_Water_Fund.pdf

Adapted from slide by UFZ team: Heidi Wittmer, Augustin Berghöfer, Johannes Förster et al.

Source of map: http://www.cenicana.org/pictures/quienes_somos/map_region_azucarera.jpg

Managing the Transition to a Green Economy is Key

Key Message:

Managing the transition to a green economy will need to **take into account not only the opportunity of win-wins**, but also the **risks of losses** for certain groups and **trade-offs across sectors** and **over time**.

Institute for European Environmental Policy

ten Brink P., Mazza L., Badura T., Kettunen M. & Withana S. (2012) *Nature and its Role in the Transition to a Green Economy.* http://www.ieep.eu/publications/2012/10/nature-and-its-role-in-the-transition-to-a-green-economy--1157

Understanding winners & losers important

Leuser National Park on Sumatra, Indonesia
Distribution of ecosystem benefits

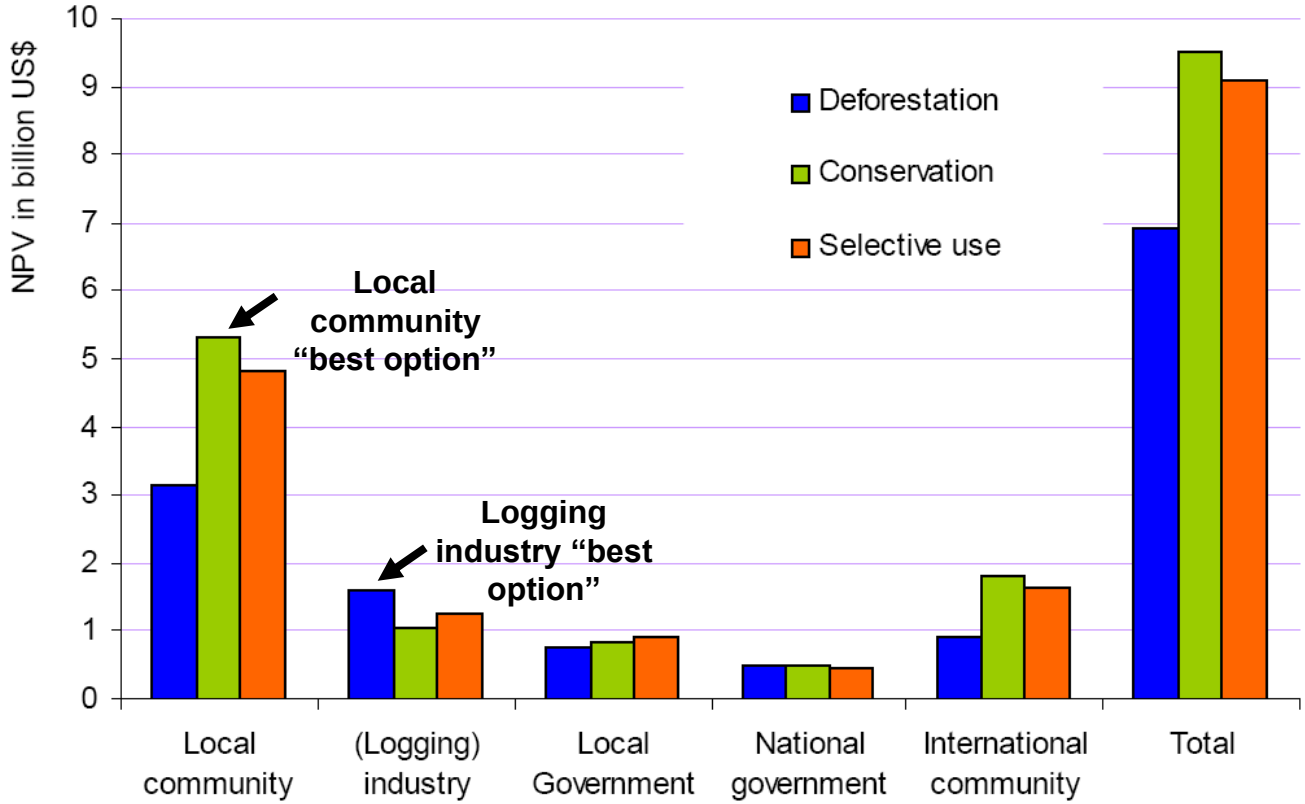


Figure 1: Benefit distribution among stakeholder under different land use scenarios in the Leuser Ecosystem (25,000 sq km), Indonesia, in Net Present Value (NPV) in billion US$ over 30 years, at a discount rate of 4%.

Sources: van Beukering, P.J.H., H.S.J. Cesar, M.A. Janssen (2003). Economic valuation of the Leuser National Park on Sumatra, Indonesia. Ecological Economics 44, pp 43-62. and van Beukering, P.J.H., H.S.J. Cesar, M.A. Janssen (2002). Economic valuation of the Leuser Ecosystem in Sumatra. In: Conservation Dividents? ASEAN Biodiversity Vol 2. Nr. 2, 17-24.

What is "best" depends on who you are: understanding who wins & who stands to lose in decisions is paramount.

Trade-offs and Timescale also important

Leuser National Park on Sumatra, Indonesia (cont.)

Range of ecosystem benefits and time profile

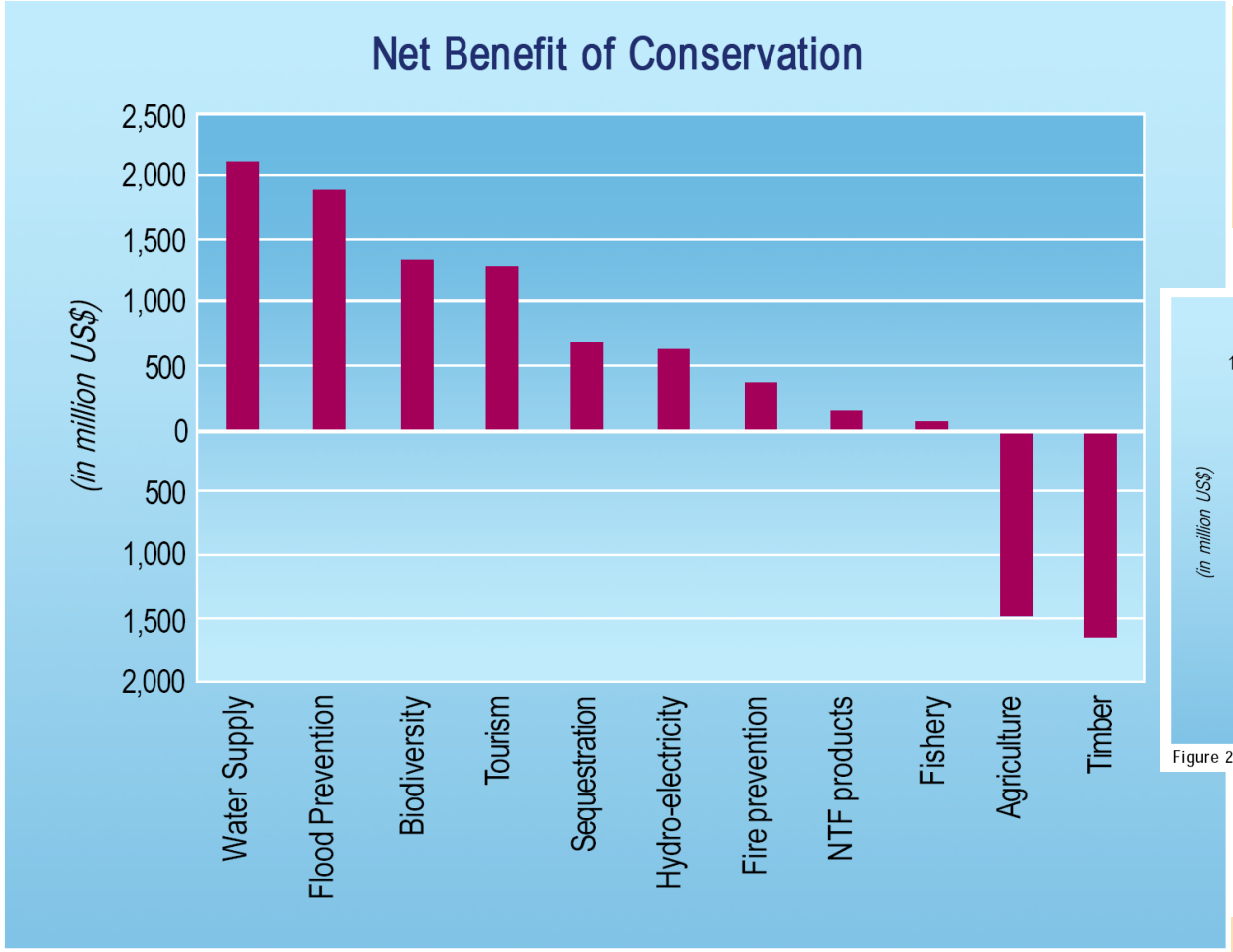


Figure 3. Net Benefits over time of Leuser National Park for the two scenarios distributed over the various categories.

There can be trade-offs across Ecosystem services

The benefits and who wins and loses will be time sensitive

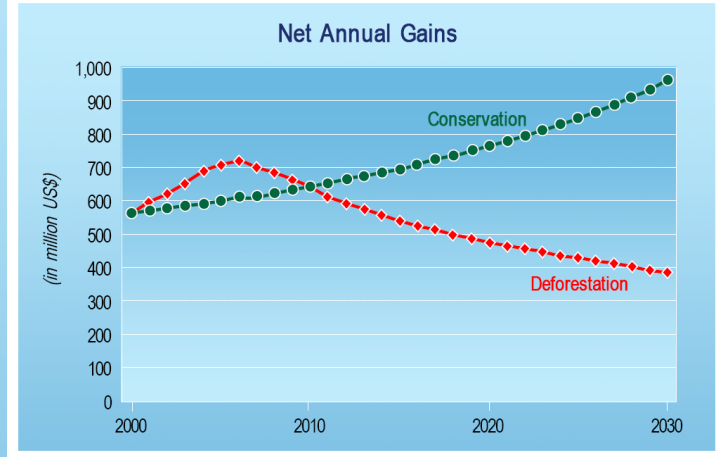


Figure 2. Net gains over time of Leuser National Park for the two scenarios.

Scenarios 2000 to 2030, discount rate 0% (Beukering et al. 2002)

Transition planning important

Sectors of the Economy benefit from Nature

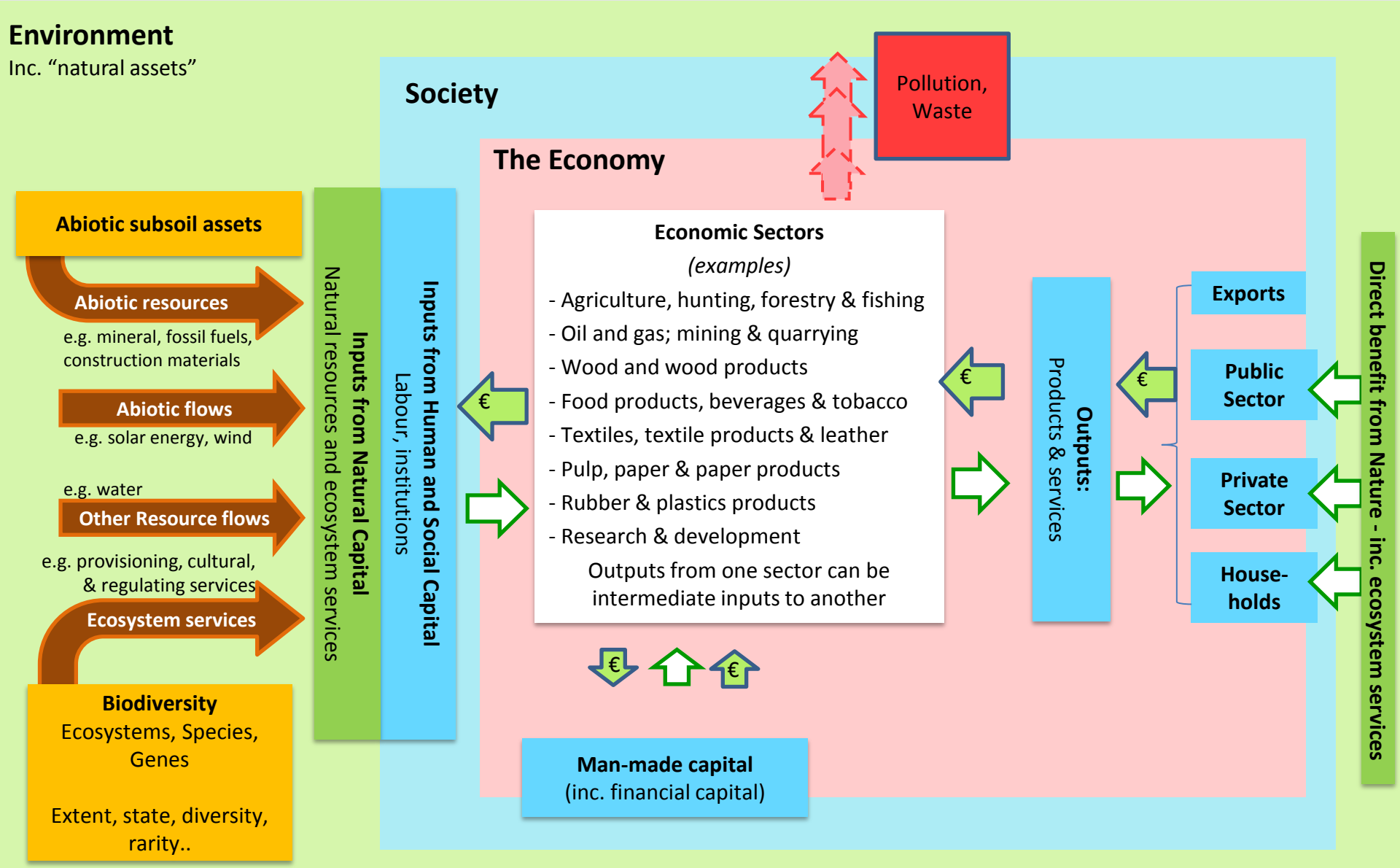
Key Message:

All sectors of the economy benefit directly or indirectly from nature and **their engagement is required** for **the transition to the green economy** in the context of **sustainable development and poverty eradication**.

Institute for European Environmental Policy

ten Brink P., Mazza L., Badura T., Kettunen M. & Withana S. (2012) *Nature and its Role in the Transition to a Green Economy.* http://www.ieep.eu/publications/2012/10/nature-and-its-role-in-the-transition-to-a-green-economy--1157

The Economy in context: Nature's inputs



Key sectors of the GREEN economy include:

- Agriculture
- Fisheries
- Water
- Forests
- Energy
- Manufacturing
- Buildings
- Transport
- Tourism
- Waste management

Primarily investing in natural capital

Primarily investing in energy and resource efficiency

Also working with nature can lead to cost-effective solutions and multiple benefits

+ Cities

Source: UNEP Green Economy Report

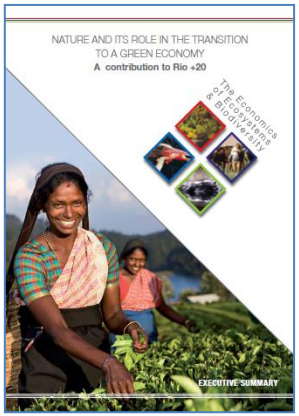
All sectors important – whether due to their dependency/benefits from nature's services, their impacts on the environment, or their opportunities for action.

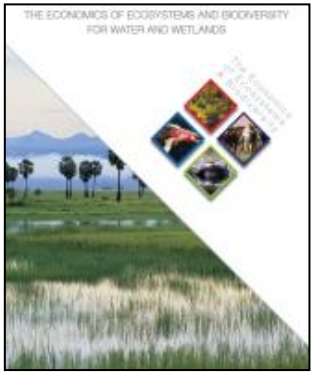
Also pharmaceuticals, food and drink, education, health...

Conclusions

1. Nature, in all its diversity, provides a wide range of benefits and values to society and the economy, referred to as natural capital. But nature is more than "just" Natural capital.
2. A green economy aims to incorporate these values from ecosystem services and biodiversity into decision-making across all levels of governance – biodiversity proofing / mainstreaming.
   - Seeking to avoid or minimise trade-offs (green the brown)
   - Env benefits through resource efficiency (green the brown)
   - Proactive investment in natural capital (build the green)
3. There are opportunities and risks in transitions to green economies as regards to human welfare and development -- transition management is critical for success.
4. PA management and Green Infrastructure are at the heart of the transition to a green economy

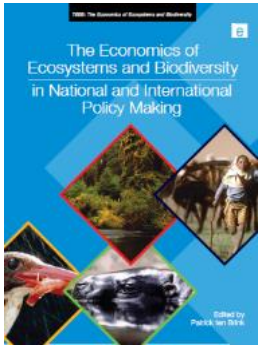
Further information





Nature in the Transition to a Green Economy
ten Brink et al., 2012

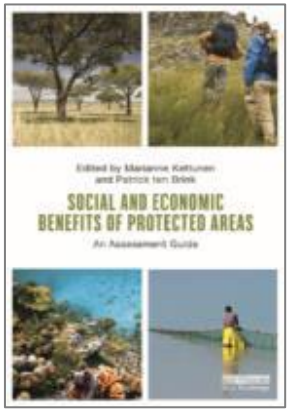
TEEB for National and International Policy Makers
(ed Patrick ten Brink 2011)



TEEB Water and Wetlands
Russi et al., 2012

Guide to Multi-benefits of Cohesion Policy Investments in Nature & GI
IEEP & Milieu 2013

& Book: On Benefits Assessment for Protected Areas
Kettunen & ten Brink (2013)
Social and Economic Benefits of Protected Areas - An Assessment Guide



IEEP is an independent, not-for-profit institute dedicated to the analysis, understanding and promotion of policies for a sustainable environment. www.ieep.eu. ptenbrink@ieep.eu

Institute for European Environmental Policy (IEEP)

- **IEEP is an independent research organisation concerned with policies affecting the environment in Europe and beyond**
  - **Research and consultancy on the development, implementation and evaluation of environmental and environment-related policies in Europe**
  - **Policy advise and intelligence**
  - **Capacity-building**
- **Interdisciplinary staff including natural** and **social scientists, lawyers** and **economists**
- **Key research areas:**
  - **Governance**
  - **Agriculture and land management**
  - **Biodiversity**
  - **Climate change and energy**
  - **Resources use, waste and chemicals**
  - **Water, marine and fisheries; and**
  - **Green Economy**